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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Fumio Matsui

MATSUI 5

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7590 09/14/2007  
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EXAMINER
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ANGEBRANNDT, MARTIN J

ART UNIT	PAPER NUMBER
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1756

MAIL DATE	DELIVERY MODE
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09/14/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 09/928,833	<b>Applicant(s)</b> MATSUI ET AL.	
	<b>Examiner</b> Martin J. Angebranndt	<b>Art Unit</b> 1756	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 July 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,7,8 and 14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,7,8 and 14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

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1. The response of the applicant has been read and given careful consideration. Rejections of the previous office action, not repeated below are withdrawn based upon the amendment of the claims and the corresponding arguments. The limitations of the dyes and the required presence of a light resistance improver

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 8 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The paragraph second paragraph “using, as a main organic dyes compound ....of said organic dyes compound, and” in claim 8 should be deleted. The language describing the dye absorption added to the claim meets these limitations and the additional language is confusing.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1,7,8 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda et al. JP 11-053758 and Usami et al. ‘122, in view of Nanba et al. JP 60-204396, Kanno ‘467 and Ootaguro et al. ‘882.

Maeda et al. JP 11-053758 (machine translation accompanys this action) teaches a substrate coated with a reflective layer, a recording layer and a protective layer. [0020]. The use

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of 530 nm or shorter wavelengths is discussed with wavelengths in the 350-520 nm disclosed 410 nm is also disclosed [0023-0025] Example dyes with absorptions in the 400-470 nm range are disclosed including trimethine cyanine dyes (d,c) and azo dyes (a,e) [0012-0015]. Example 1 uses Ni:azo dye (a) and 515 nm with a spot size of 0.48 microns [0027-0030], example 2, uses dye (b) and 430 nm laser light [0031-0033], example 3 uses a 515 nm laser beams with a spot size of 0.48 microns.

Usami et al. '122 teaches pitches for optical recording media substrates these may be 0.3-0.9 microns. (6/5-18). The use of recording layers having dyes such as cyanine, and metal (Ni,Cr) complex dyes is disclosed. (6/19-34).

Nanba et al. JP 60-204396 teaches the absorption of dyes D32 (perchlorate) and D36 (bromide) in the table on page 29. The absorption maxima of dye D36 is 880 nm and the reflection maxima is 970 nm. The wavelength used in recording is 830 nm (page 29, left column) for the examples disclosed in table 1 on page 30. **Example 3 uses dye D36, which has absorption maxima at wavelengths greater than 830 nm together with dye D32 and metal chelate Q3-12. The chelate is present in an amount of 4 parts to five parts of D36.** The use of dyes which have an absorption maxima within the range 40 nm shorter and 70 nm longer than the writing wavelength is disclosed in the abstract. The use of lasers including HeNe (632.8 nm), Argon ion (488, 514.5 nm), HeCd (442 and 325 nm) is disclosed on page 28 in the lower left hand column. Useful counterions include perchlorate, tetrafluoroborate, aryl sulfonic acids (page 8, right hand column). Linkages disclosed include trimethine and monomethine linkages LVIII and LIX on page 8 of the reference.

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Kanno '467 teaches optical recording media based upon trimethine cyanine dyes and discusses development using shorter wavelengths and higher NA to increase the data content of optical recording media due to the smaller laser spot size (3/37-51).

Ootaguro et al. '882 teaches in examples 54 and 55, the coating of a solution of 3 parts cyanine dye NK 2421 (a heptamethine cyanine dyes with a perchlorate anion, see Maruyama et al. below) and 1 part 4-N,N-diethylamino-4'-nitrosodiphenylamine (the ethyl homologue of the compound used in example 1 of the instant specification) (0.33:1 ratio), which is coated on a glass substrate. 4-N,N-diethylamino-4'-nitrosodiphenylamine is disclosed as having a maximum absorption at 440 nm. (24/28). 4-N,N-dimethylamino-4'-nitrosodiphenylamine is also disclosed (6/24-37). These compounds are disclosed as not suffering from the low solubility of other stabilizers, such as metal complexes (2/6-43).

It would have been obvious to modify Maeda et al. JP 11-053758 by adding pregrooves with pitches of 0.3-0.4 microns as taught by Usami et al. '122 with a reasonable expectation of forming a useful optical recording medium with a higher recording capacity than those with larger pitches (ie more tracks on the medium) and to use the shorter wavelength lasers of 410 nm taught by Maeda et al. JP 11-053758 based upon the direction within Kanno et al. that this results in a smaller spot size and the direction within Nanba et al. JP 60-204396 to the use of laser wavelengths which are up to 40 nm shorter than the absorption of the dye with a reasonable expectation of being able to record small data spots resulting in increased information density which would be above 15 Gb. (that of HD-DVD) and to use mixtures of cyanine dyes as taught by Nanba et al. JP 60-204396. and further it would have been obvious to one skilled in the art to modify the recording media resulting from the combination of Maeda et al. JP 11-053758 with

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Usami et al. '122, Nanba et al. JP 60-204396 and Kanno '467 by adding the light stabilizing 4-N,N-diethylamino-4'-nitrosodiphenylamine of Ootaguro et al. '882 rather than the metal chelate quenchers due to its increased solubility as with the added advantages that as it absorbs in the blue, it would confer additional sensitivity to the optical recording medium based upon the absorption maximum within 30 nm of the laser wavelength as taught by Nanba et al. JP 60-204396 and confer sensitivity at 410 nm (which is about 405 nm), if this is not already present.

*What might prove to be patentable is the use of optical recording media consisting of trimethine cyanine dyes, such as those disclosed by the applicant as chemical formulae 20-38, where other absorbers/dyes are not present. This would exclude the nitroso compound used as a quencher as well due to its absorption at 440 nm. (claims 1-5,7 and 14 would have to be cancelled). The limitation of the claims to these dyes combined examples using them alone and data relating to their absorption maxima may serve to obviate the rejections of record for the method claims, in particular if the absorption maxima are evidenced to be more than 40 nm longer than 450 nm. There are not examples using these dyes without other dyes and the dyes of compounds 1-19 would not work well as they absorb solely at longer wavelengths and there is an issue of if the trimethine, styryl or azo dyes would work by themselves which is not addressed by the examples.*

The applicant argues that the claims do not embrace the use of 4-N,N-diethylamino-4'-nitrosodiphenylamine as the light absorber. But fails to appreciate that the composition can be present in the recording layer as the light resistance improver. Indeed the instant disclosure describes it as such and therefore it can be present and based upon its absorption it can act as a light absorber as well as a light resistance improver. The presence of the dye absorbing at longer

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wavelengths would be to just increase the spectral range. The applicant is directed to JP 62-246590 which uses a dithiolate compound known to be a quencher as evidenced by Nanba et al. at page 20 to sensitize the composition to a laser. It is clear that the 4-N,N-diethylamino-4'-nitrosodiphenylamine of Ootaguro et al. '882 can sensitize the media to the laser as all that necessary to enable recording is the absorption of the laser light (to generate heat) and that its absorption at 440 nm allows a 410 nm laser to be used and the absorption of the "organic dye" is at longer wavelengths than the laser wavelength. The specific dye used or a mixture of dyes present in the recording layer does not matter as long as the laser is absorbed and the heat generated to degrade the dye mixture at that location. While the absorption of the trimethine dyes may extend to the 380-405 nm range, if these were limited to those compounds having absorption maxima at more than 450 nm, it would seem clear that the absorption would be small and the sensitivity very poor and so would be relatively undesirable without some other absorber for the shorter wavelength. The applicant fails to appreciate that there is a reasonable expectation that the nitroso compounds of Ootaguro et al. '882 would be able to stabilize cyanine dyes based upon the broad disclosure of this in column 7 at lines 36-58. The high density of the recording structure is found in the teachings of Maeda et al. JP 11-053758, Usami et al. '122 and Kanno '467, so there is no need for this to be taught elsewhere, such as in Ootaguro et al. '882. **The applicant could exclude the light quenchers such as the nitroso compounds disclosed to obviate this rejection. Further it is clear that the diffraction limited spot size of the focused laser is controlled by the laser wavelength, not the dye absorption.**

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6. Claims 1,7,8 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda et al. JP 11-053758 and Usami et al. '122, in view of Nanba et al. JP 60-204396, Kanno '467 and Ootaguro et al. '882, further view of Kanno et al. GB 23297.

Kanno et al. GB 2329751 teaches that styryl dyes are better form shorter wavelength as low as 500 nm optical recording media than cyanine dyes (pages 5-9). The styryl dyes are of the formula shown on page 9. The use of quenchers or stabilizers is disclosed (page 27)

To address the embodiments bound by the claims, but not rendered obvious above, the examiner cites Kanno et al. GB 2329751, who teaches styryl dyes and holds that it would have been obvious to modify the media resulting from the combination of Maeda et al. JP 11-053758 with Usami et al. '122, Nanba et al. JP 60-204396, Kanno '467 and Ootaguro et al. '882 as discussed above by using styryl dyes disclosed by Kanno et al. GB 2329751 in place of the cyanine dyes with a reasonable expectation of gaining the increased sensitivity to the shorter wavelengths ascribed to the use of these dyes by Kanno et al. GB 2329751 and the clear extension of sensitivity to wavelengths of about 440 nm due to the presence of the 4-N,N-diethylamino-4'-nitrosodiphenylamine of Ootaguro et al. '882 which is a known stabilizer quencher.

The response above is relied upon to address any arguments by the applicant.

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

JP 58-175693 and JP 62-246590 teach dithiolate compounds used to sensitize optical recording media.



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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J. Angebranndt whose telephone number is 571-272-1378. The examiner can normally be reached Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Martin J Angebranndt  
Primary Examiner  
Art Unit 1756

9/12/2007